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## Research Note

# Client Predictors of Treatment Retention and Completion in a Program for Homeless Veterans

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*This study assessed the value of a specific set of client variables in predicting treatment retention and completion of a rehabilitation program for homeless veterans. Participants were 596 (22 female) military veterans admitted to the Palo Alto, California Veterans Administration domiciliary program between 1992 and 1995. Information was collected on a number of demographic and background characteristics previously used to predict treatment retention and outcomes. Results indicated that clients who were younger, female, and currently diagnosed with a depressive disorder, showed the highest rates of treatment retention and completion, whereas a current personality disorder diagnosis or history of psychiatric treatment was related to poorer rates of retention and completion. These results may be informative for identifying ways to modify this and other similar treatments to apply to a larger client population. The study's limitations were noted.*

**Keywords:** client variables; homeless; treatment retention

## Introduction

Estimates indicate a dramatic increase in the prevalence of homelessness in the United States, with an estimated 2.3 million adults likely to experience homelessness in a given year (Urban Institute, 2000). Homelessness is a heterogeneous state, involving a variety of complex causes, consequences, and demands on systems for support and intervention. Sixty-five to 85% of homeless individuals suffer from chronic "substance abuse,"<sup>1</sup> psychiatric distress, or a combination of the two (Baum and Burns, 1993). The presence of substance use disorders among the homeless has been shown to decrease opportunities for obtaining housing or employment, to increase levels interpersonal conflict, to increase risk for HIV infection and other serious health problems, and to increase the incidence of arrest and

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<sup>1</sup>The journal's style utilizes the category *substance abuse* as a diagnostic category. Substances are used or misused; living organisms are and can be *abused*. Editor's note.

victimization (Coumans and Spreen, 2003; Devine and Wright, 1997; Erickson and Trocki, 1992; Zlotnick et al., 2003).

As part of a multisite Department of Veterans Affairs (VA) initiative to address the needs of homeless veterans, the VA began to establish residential rehabilitation programs for homeless veterans in 1987, known as the Domiciliary Care for Homeless Veterans (DCHV) (Leda et al., 1990). The present study evaluates rates of treatment retention and completion for one DCHV program in Palo Alto, California that has been distinguished by the VA Undersecretary for Health as a Clinical Program of Excellence.

A prior evaluation of this program demonstrated that participants experience decreased rates of unemployment and homelessness and increased rates of abstinence (Burling et al., 1994, 2004). These successful outcomes may be attributed to the program's comprehensive treatment approach that addresses the multiple complex problems presented by a homeless substance-dependent population, including unemployment, interpersonal problems, and legal issues. This comprehensive treatment approach is based on a combination cognitive behavioral (CB) and therapeutic community (TC) approach and draws on the strengths and empirical support for both intervention strategies (Burling et al., 2004).

A key determinant of the success of DCHV and similar programs appears to be the ability of these programs to retain clients in treatment (Hubbard et al., 1997; McCusker et al., 1996; Stark, 1992). In fact, studies suggest that duration of treatment is a better predictor of successful outcomes than is the amount or intensity of the treatment provided (Moos and Moos, 2003). However, little is known about the specific client characteristics associated with retention of homeless clients.

## Methods

The sample included 596 veterans (574 male and 22 female) admitted to the Palo Alto DCHV program between February 1992 and April 1995. Most participants were between the ages of 30 and 60 (93.7%; range, 22–62). Almost all residents met criteria for substance dependence (95.6%), with 64.0% meeting criteria for both alcohol and drug dependence. Drugs commonly misused included cannabis, heroin, and cocaine. Most participants had previously received treatment to reduce or eliminate their substance use (77.2%), but far fewer had received psychiatric treatment (24.0%). Table 1 provides additional information regarding this sample.

The treatment program is described in detail by Burling and colleagues (2004). Briefly, the goal of treatment is abstinence from drugs and alcohol and social and vocational rehabilitation through use of a combination CB–TC approach. Successful program completion typically requires 6 months and is attained when a resident completes all treatment components (i.e., demonstrates competency in the core cognitive behavioral (CB) skills, completes vocational training courses, reaches personal change goals set forth in the individualized treatment plan, etc.), is able to obtain stable employment and housing, and has reached a level of financial stability sufficient to support independent living. Residents who achieve these goals, remain abstinent from substances, and attend 13 weeks of an aftercare program are invited to graduate.

## Data Collection and Analysis

Data were collected as part of a larger study described elsewhere (Burling et al., 2001). Baseline data were obtained at time of admission via a face-to-face interview designed

**Table 1**  
Selected veteran characteristics ( $N = 596$ )

Variable	Percent
Ethnicity	
African American	47
Hispanic American	7
White American	44
Marital status	
Married	4
Separated/divorced	65
Never married	30
Other psychiatric diagnosis	
Axis I	52
Axis II	81
Other medical illness	
Yes	34
No	66
Period of military service	
Pre-Vietnam era	10
Vietnam era	54
Post-Vietnam era	36
Receiving disability compensation	
Yes	13
No	87
Living situation upon admission	
Homelessness	43
Institution (hospital, halfway house, prison)	28
Lived with someone else/intermittent housing	23
Lived in own apartment/house	5
Employed at least one day in past month	
Yes	25
No	75

specifically for admissions into this program. Data collected included demographic information; past and current psychiatric, medical, and/or substance use-related problems; and history of treatment or hospitalization. Diagnoses were confirmed via semistructured interview Structured Clinical Interview of Personality Disorders (SCID-II) and Structured Clinical Interview for DSM-III-R (SCID-P) within the first 4 days of admission. A second set of data was collected at discharge and included medical and psychiatric diagnoses, length of stay, mode of discharge from the program (e.g., successfully completed the program, left prematurely by choice, etc.), and postdischarge living and employment arrangements.

Bivariate and multivariate analyses were used to examine the relationship between each client variable and treatment retention (i.e., length of stay, program completion, and graduation). The variables found to be significantly related to retention were then used in a series of regression equations to identify a set of indicators of treatment retention.

**Table 2**  
Demographic characteristics and treatment retention and completion

Characteristic	Average length of stay (no. of days)	Completed (%)	Graduated (%)
Ethnicity			
Black ( <i>n</i> = 277)	93.4 ± 5.6	20.6	17.3
White ( <i>n</i> = 262)	96.3 ± 6.2	22.9	11.8
<i>t</i> or $\chi^2$	<1	<1	3.2
Age			
<30 ( <i>n</i> = 25)	145.8 ± 18.7	60.0	28.0
30–39 ( <i>n</i> = 213)	111.1 ± 7.1	26.8	16.9
40–49 ( <i>n</i> = 287)	89.7 ± 5.3	19.9	14.3
50–59 ( <i>n</i> = 60)	70.4 ± 10.9	11.7	10.0
≥60 ( <i>n</i> = 11)	28.6 ± 11.0	0	0
<i>F</i> or $\chi^2$	5.9***	30.4***	7.1**
Gender			
Male ( <i>n</i> = 574)	95.0 ± 4.0	22.1	14.3
Female ( <i>n</i> = 22)	139.3 ± 21.9	40.9	36.4
<i>t</i> or $\chi^2$	2.2*	4.2*	8.1**

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

## Results

The median length of stay for program residents was 59 days (range, 1–500 days). One fourth of residents (25.1%) completed the treatment program, and 15.1% graduated. Rates of program retention, completion, and graduation were highest among female residents (Table 2). Residents in their 20s remained in treatment significantly longer, were more likely to graduate than were residents over 50, and were significantly more likely to complete the program as compared with all other age groups (Table 2 and Figure 1). Ethnicity was unrelated to any measure of treatment retention or completion.

Depressed patients remained in treatment significantly longer than did nondepressed residents and also were significantly more likely to complete the program. Residents diagnosed with a personality disorder were significantly less likely to remain in treatment, complete the program, or graduate as compared with those without a personality disorder diagnosis. Table 3 illustrates both of these relationships.

Residents who had previously received treatment for drug dependence were significantly more likely to graduate, as compared with those who had not previously received treatment (Table 3). On the other hand, residents with a history of psychiatric treatment remained in the program for a shorter length of time and were less likely to complete the program, as compared with those without treatment histories.

Next, we conducted a series of linear regression analyses predicting length of stay from the significant variables in Tables 2 and 3. A set of four variables—age, gender, current diagnosis of depression, and history of psychiatric treatment—independently predicted length of stay in treatment (Table 4, first column).

Finally, we conducted separate logistic regression analyses to predict program completion and graduation (Table 4). Four variables predicted program completion: age,

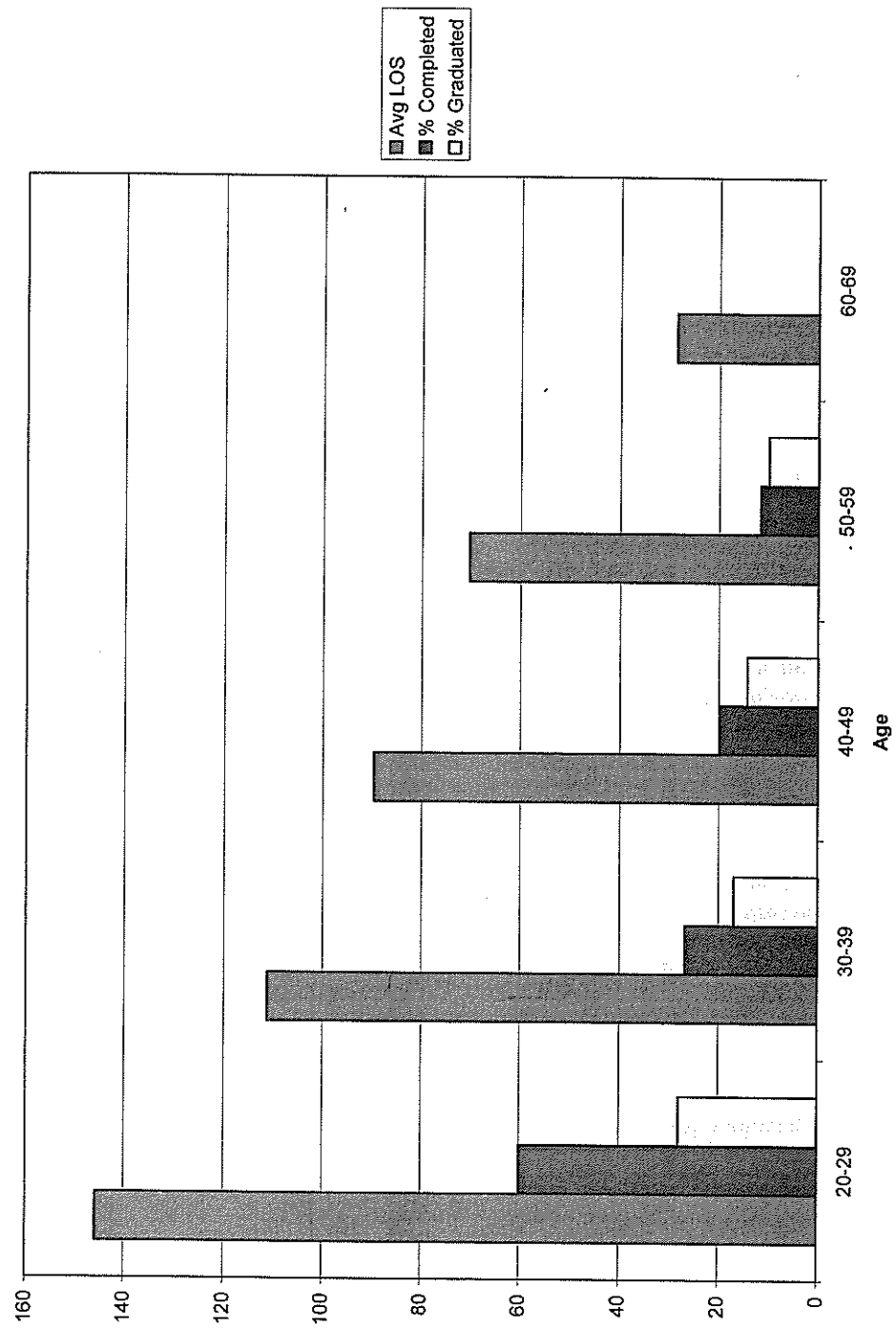


Figure 1. Comparison of treatment retention and completion rates across each decade of life.\*LOS = Length of stay



Table 3

	Length of stay		<i>t</i>	Completed (%)		Graduated (%)	
	Absent	Present		Absent	Present	Absent	Present
Psychiatric diagnosis							
Depression	88.0 ± 5.0	108.1 ± 6.2	2.5*	19.8	26.8	13.0	17.9
Personality disorder	117.5 ± 9.9	91.9 ± 4.2	2.5*	36.0	19.8	24.3	13.0
History of treatment							
Alcohol	95.1 ± 6.5	97.6 ± 5.0	<1	22.9	22.8	14.1	15.7
Drug	93.7 ± 5.8	99.3 ± 5.4	<1	20.6	24.8	10.5	19.1
Psychiatric	101.1 ± 4.6	82.8 ± 7.4	2.0*	25.0	16.1	15.5	14.0

$$*p < .05, **p < .01, ***p < .001.$$

**Table 4**  
Regression analyses predicting treatment retention and completion

Predictors	Length of stay	Completion		Graduation	
	Standardized $\beta$	$\beta$	Odds ratio	$\beta$	Odds ratio
Age	-.19***	-.08***	.93	-.03	.97
Gender (female = 1)	.08*	1.04*	2.84	1.34**	3.81
Current diagnosis of depression	.10**	.40	1.50		
Current diagnosis of personality disorder	-.08	-.71**	.49	-.82**	.44
History of drug treatment				.70**	2.01
History of psychiatric treatment	-.10**	-.66**	.52		
Intercept		2.52***		.52	
Model fit ( $F$ or $\chi^2$ )	8.78*** $R^2 = .07$	57.56***		27.10***	

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .  
For LOS model,  $F(5,589) = 8.78***$ .

gender, current personality disorder diagnosis, and history of psychiatric treatment. Three variables predicted graduation: gender, current personality disorder diagnosis, and history of drug user treatment.

## Discussion

Clients who were most likely to remain in the Palo Alto DCHV program were younger and female, with a history of prior treatment for drug dependence but without an Axis II diagnosis or a history of psychiatric treatment. These findings are generally consistent with the existing treatment outcome literature. Consistent with previous studies of racially diverse samples, there was no relationship between client race and likelihood of treatment retention or completion (Beckerman and Fontana, 2001; De Leon et al., 1993). Women were more likely to remain in treatment as compared with men, even though they were in a clear minority. This is consistent with the existing literature showing that gender differences are evident in the factors that predict treatment retention (Chou et al., 1998; Green et al., 2003).

Residents in their 20s were four times more likely to remain in treatment for 90 days or more and six times more likely to complete the program than were residents over 50. This finding cannot be explained by age differences in any of the key variables (e.g., medical conditions, number of previous treatments) but may be explained by program focus. The Palo Alto DCHV requires significant personal change and acceptance of new roles in life, a process that could be more difficult for older individuals. Some veterans come to the program with marketable job skills; however, many find themselves without a marketable trade or unable to obtain a job in their field of choice due to a criminal record. Younger veterans may be more responsive to the programs' vocational rehabilitation focus and may have an easier time of finding employment once they return to the community.



A current diagnosis of depression was predictive of length of stay (Agosti et al., 1991; Broome et al., 1999). The DCHV program's success in retaining residents with comorbid depression may be attributable directly to the use of cognitive behavioral skills in the program and indirectly to the improving communication and conflict resolution skills or to helping clients obtain employment and build a sober support network. Unsurprisingly, a negative correlation was found between personality disorder diagnoses and treatment completion. Patients with personality disorders often display interpersonal difficulties that may interfere with their ability to integrate into the TC milieu (Overholser, 1996) or lead them to be resistant to change longstanding behavior patterns or to recognize that these patterns are maladaptive.

A history of previous drug user treatment predicted higher rates of program graduation. This suggests that multiple treatment episodes may have a positive cumulative effect for a homeless population with relatively severe substance use disorders. Conversely, a history of psychiatric treatment was predictive of poorer program retention and completion. Previous psychiatric treatment might be indicative of more serious nondrug use-related psychopathology requiring direct intensive interventions that are beyond the scope of services offered in a DCHV setting.

In conclusion, we highlight several important limitations. First, this study relied heavily on self-report data, and information regarding treatment history is vulnerable to misreporting. Second, legal pressure to participate in substance user treatment has been shown to positively influence treatment retention (Hiller et al., 1998; Vickers-Lahti et al., 1995). The present data contain no record of legal referral; thus, it is possible that patterns of treatment retention identified in this investigation may be attributed to legal pressure to remain in treatment. Third, most clients (75%) in this sample did not complete the treatment program. Although this completion rate is comparable with published evaluations of similar programs (Mierlak et al., 1998; Orwin et al., 1999), it is problematic in that the resultant sample gives us inadequate statistical power to identify variables that might differentially predict program completion versus graduation. Additionally, sample sizes of women and clients under 30 were small, suggesting some caution in interpreting results for these groups as well.

Finally, the variables that we examined did not account for a substantial portion of the overall variance in predicting study outcomes. Retention appears to be best predicted by more dynamic (i.e., changeable) client characteristics, such as motivation and program participation (De Weert-Van Oene et al., 2001), as opposed to unchangeable characteristics, such as demographics. This finding suggests that treatment success is likely a matter of determining ways to influence clients' perceptions and experiences, as opposed to struggling against fixed characteristics that are difficult or impossible to change.

### Acknowledgments

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### RESUME

Cette étude a examiné la capacité d'un groupe de variables de client pour expliquer la conservation de traitement et l'accomplissement de traitement dans un programme

de réadaptation pour les vétérans sans foyer. Les participants étaient 596 (femelle 22) vétérans militaires admis à Palo Alto, programme domiciliary de VA de CA entre 1992 et 1995. L'information a été rassemblée sur un nombre de caractéristiques démographiques précédemment employées pour prévoir la conservation et les résultats de traitement. Les résultats ont indiqué que les clients qui étaient plus jeunes, femelles, et ont été actuellement diagnostiqués avec un désordre dépressif, démontré les taux les plus élevés de conservation et d'accomplissement de traitement, alors qu'un diagnostic de désordre de personnalité ou une histoire de traitement psychiatrique était lié à des taux plus faibles de conservation et d'accomplissement. Ces résultats peuvent être instructifs pour identifier méthodes de modifier ceci et d'autres traitements semblables pour s'appliquer à une plus grande population de clientes. Les limitations de l'étude ont été notées.

### RESUMEN

Este estudio determinó el valor de un sistema específico de variables del cliente en la retención del tratamiento el predecir y la terminación de un programa de la rehabilitación para los veteranos sin hogar. Los participantes eran 596 (la hem bra 22) veteranos militares admitidos al Pale Alto, programa domiciliary del V A del CA entre 1992 y 1995. La información fue recogida en un numero de características demograficas y del tendo usadas previamente para predecir la retención y resultados del tratamiento. Los resultados indicaron que los clientes que eran mas jóvenes, femeninos, y fueron diagnosticados actualmente con un desorden depresivo, demostrado los indices mas altos de la retención y de la terminación del tratamiento, mientras que una diagnosis del desorden de la personalidad o una historia actual del tratamiento psiquiatrico fue relacionada con indices mas pobres de la retención y de la terminación. Estos resultados pueden ser informativos para identificar maneras de modificar esto y otros tratamientos similares para aplicarse a una poblaci6n mas grande del cliente. Las limitaciones del estudio fueron observadas.

### RIASSUNTO

Questo studio ha valutato il valore di un insieme specifico delle variabili del cliente nel ritegno di trattamento di predizione e nel completamento di un programma di riabilitazione per i veterani senza casa. I partecipanti erano 596 (femmina 22) veterani militari ammessi a Pale Alto, programma domiciliary di VA di CA fra 1992 e 1995. Le informazioni sono state raccolte su un certo numero di caratteristiche della priorita bassa e demografiche precedentemente usate per predire il ritegno ed i risultati ditrattamento. I risultati hanno indicato che clienti che erano piu giovani, femminili ed attualmente sono stati diagnosticati con 'Un disordine depressive, indicato gli piu alti tassi di ritegno e di completamento di trattamento, mentre una diagnosi di disordine di personalita 0 una storia corrente del trattamento psichiatrico e stata collegata con i tassi piu difficili di ritegno e di completamento. Questi risultati possono essere informativi per identificare i sensi modificare questo ed altri trattamenti simili per applicarsi ad una piu grande popolazione del cliente. Le limitazioni delle studio sono state notate.

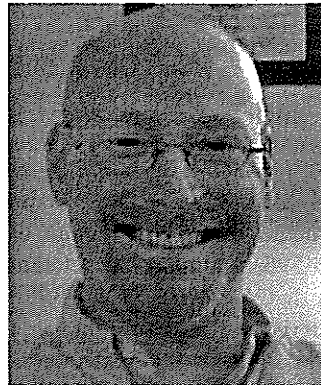
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## References

- Agosti, V., Nunes, E., Stewart, J. W., Quitkin, F. M. (1991). Patient factors related to early attrition from an outpatient cocaine research clinic. *Int. J. Addict.* 26:327-334.
- Baum, A. S., Burns, D. W. (1993). *A Nation in Denial: The Truth About Homelessness*. Boulder, CO: Westview Press Inc.



- Beckerman, A., Fontana, L. (2001). Issues of race and gender in court-ordered substance abuse treatment. *J. Offender Rehabil.* 33:45-61.
- Broome, K. M., Flynn, P. M., Simpson, D. D. (1999). Psychiatric comorbidity measures as predictors of retention in drug abuse treatment programs. *Health Serv. Res.* 34:791-806.
- Burling, T. A., Anderson, S. G., Seidner, A. L., Brenner, G. F., Marshall, G. D. (2004). A cognitive behavioral therapeutic community for substance dependent homeless. Unpublished manuscript.
- Burling, T. A., Burling, A. S., Latini, D. (2001). A controlled smoking cessation trial for substance-dependent inpatients. *J. Consult. Clin. Psychol.* 69:295-304.
- Burling, T. A., Seidner, A. L., Salvio, M. A., Marshall, G. D. (1994). A cognitive-behavioral therapeutic community for substance dependent and homeless veterans: treatment outcome. *Addict. Behav.* 19:621-629.
- Chou, C., Hser, Y., Anglin, M. D. (1998). Interaction effects of client and treatment program characteristics on retention: an exploratory analysis using hierarchical linear models. *Substance Use & Misuse* 33:2281-2301.
- Coumans, M., Sreen, M. (2003). Drug use and the role of homelessness in the process of marginalization. *Substance Use & Misuse* 38:311-338.
- De Leon, G., Melnick, G., Schoket, D., Jainchill, N. (1993). Is the therapeutic community culturally relevant? Findings on race/ethnic differences in retention in treatment. *J. Psychoactive Drugs* 25:77-86.
- De Weert-Van Oene, G. H., Schippers, G. M., DeJong, C. A. J., Schrijvers, G. J. P. (2001). Retention in substance abuse dependence treatment: the relevance of in-treatment factors. *J. Subst. Abuse Treat.* 20:253-261.
- Devine, J. A., Wright, J. D. (1997). Losing the housing game: the leveling effects of substance abuse. *Am. J. Orthopsychiatry* 67:618-631.
- Erickson, K. P., Trocki, K. F. (1992). Behavioral risk factors for sexually transmitted diseases in American households. *Soc. Sci. Med.* 34:843-853.
- Green, C. A., Polen, M. R., Dickinson, D. M., Lynch, F. L., Bennett, M. D. (2003). Gender differences in predictors of initiation, retention, and completion in an HMO-based substance abuse treatment program. *J. Subst. Abuse Treat.* 23:285-295.
- Hiller, M. L., Knight, K., Broome, K. M., Simpson, D. D. (1998). Legal pressure and treatment retention in a national sample of long-term residential programs. *Crim. Justice Behav.* 25: 463-481.
- Hubbard, R. L., Craddock, S. G., Flynn, P. M., Anderson, J., Etheridge, R. M. (1997). Overview of 1-year follow-up outcomes in the Drug Abuse Treatment Outcome Study (DATOS). *Psychol. Addict. Behav.* 11:261-278.
- Leda, C., Rosenheck, R., Medak, S., Olson, R. (1990). Advances of the home front: domiciliary care for homeless veterans. *VA Practitioner* 7:91-103.
- McCusker, J., Stoddard, A., Frost, R., Zorn, M. (1996). Planned versus actual duration of drug abuse treatment. *J. Nerv. Ment. Dis.* 184:482-489.
- Mierlak, D., Galanter, M., Spivack, N., Dermatis, H., Jurewicz, E., De Leon, G. (1998). Modified therapeutic community treatment for homeless dually diagnosed men: who completes treatment?. *J. Subst. Abuse Treat.* 15:117-121.
- Moos, R. H., Moos, B. S. (2003). Long-term influence of duration and intensity of treatment on previously untreated individuals with alcohol use disorders. *Addiction* 98:325-337.
- Orwin, R. G., Garrison-Mogren, R., Jacobs, M., Sonnefeld, L. J. (1999). Retention of homeless clients in substance abuse treatment: findings from the National Institute on Alcohol Abuse and Alcoholism Cooperative Agreement Program. *J. Subst. Abuse Treat.* 17:45-66.
- Overholser, J. C. (1996). The dependent personality and interpersonal problems. *J. Nerv. Ment. Dis.* 184:8-16.
- Stark, M. J. (1992). Dropping out of substance abuse treatment: a clinically oriented review. *Clin. Psychol. Rev.* 12:93-116.
- Urban Institute. (2000). A New Look at Homelessness in America. Retrieved September 23, 2004 from <http://www.urban.org/url.cfm?ID=900366>.

- Vickers-Lahti, M., Garfield, F., McCusker, J., Hindin, R., Bigelow, C., Love, C., Lewis, B. (1995). The relationship between legal factors and attrition from a residential drug abuse treatment program. *J. Psychoactive Drugs* 27:17-25.
- Zlotnick, C., Tam, T., Robertson, M. J. (2003). Disaffiliation, substance use, and exiting homelessness. *Substance Use & Misuse* 38:577-599.